FOCAL PLANE ARRAY FOR THZ IMAGER AND ASSOCIATED METHOD

ABSTRACT OF THE DISCLOSURE

A high-frequency imaging system for the millimeter and submillimeter radiation includes a high frequency lens to image an object at its focal plane. The object emits electromagnetic radiation at a first frequency above the microwave band of the electromagnetic spectrum. A local oscillator generates an electromagnetic beam at a second frequency to illuminate a plurality of dual-frequency antennas at the focal plane of the lens. Intermodulation of first and second frequencies generates a signal distribution of a third frequency over the focal plane, which represents an image. Also, a method of providing an image at the third frequency of an object emitting electromagnetic radiation at a first frequency is provided. The method includes imaging the electromagnetic radiation at the first frequency from each point of the object onto the focal plane. An electromagnetic beam is transmitted to illuminate all elements of the focal plane array.